

IN THE SPECIFICATION

Page 1, line 1, please insert the following before the first heading:

RELATED APPLICATIONS

A1 This application is a continuation of Application Serial No. 08/491,153 ^{now U.S. Patent 5,764,543} filed June 16, 1995 by Brian M. Kennedy and entitled "Extensible Model Network Representation System for Process Planning", pending. --

IN THE CLAIMS

Please cancel Claims 1-40 and insert the following new claims:

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-- 1. A computer system for modeling a process capability for use in process planning on the computer system, the computer system comprising:

a plurality of operation models defined from an operation model type and stored by the computer system, each operation model representing an activity that can be performed by a process;

a plurality of buffer models defined from a buffer model type and stored by the computer system, each buffer model representing rules for controlling a flow of material between activities, the activities represented operation models;

the operation model type and buffer model type each having a plurality of fields defining attributes; and

a process network model, stored by the computer system, interrelating the operation models and the buffer models as nodes;

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the process network model formed by the plurality of operation models each specifying buffer models from which material is consumed and buffer models to which material is supplied;

such that material usage is represented by the process network model along with timing constraints between activities.

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42. The computer system of Claim 41, further comprising:
a plurality of resource models defined from a resource model type and stored by the computer system, each resource model representing capacity available for use in performing an activity and rules for allocating capacity to the activity, the activity represented by an operation model;

the resource model type having a plurality of fields defining attributes;

the process network model further interrelating the the resource models as nodes;

the process network model further formed by the plurality of operation models each specifying resource models having capacity used in performing the activity specified by the operation model;

such that both material and capacity usage are simultaneously represented by the process network model along with timing constraints between activities.

43. The computer system of Claim 42, wherein each plurality of fields includes a plurality of extension selector fields that allow a user to specify one of a plurality of optional extensions incorporating additional fields and

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A2 semantics in addition to fields specified by the model type into each model selecting the optional extension.

44. The computer system of Claim 42, further comprising:
a plurality of operation-plan models defined from an operation-plan model type and stored by the computer system, each operation-plan model representing a planned activity to be performed during a particular period in order to achieve a particular purpose;

a plurality of resource-plan models defined from a resource-plan model type and stored by the computer system, each resource-plan model representing an amount of available capacity and planned usage of the available capacity by operation-plan models; and

a plurality of buffer-plan models defined from a buffer-plan model type and stored by the computer system, each buffer-plan model representing planned flow of material that controlled by the buffer-plan model as a result of planned operation-plan models;

the operation-plan model types, buffer-plan model types, and resource-plan model types each having a plurality of fields that define attributes, including a plurality of extension selector fields corresponding to operation, buffer, and resource model type fields and specifying corresponding extension of a plurality of optional extensions which incorporate additional fields and semantics into each model selecting the optional extension in addition to those specified by the model type; and

a process-plan network model, stored by the computer system, interrelating the defined operation models, the buffer models, and the resource models as nodes;

the process-plan network model formed by operation-plan models specifying buffer-plan models from which material is consumed and buffer-plan models to which material is supplied and specifying resource-plan models having capacity planned to be used in order to perform the activity specified by the operation-plan model;

such that both material and capacity usage are simultaneously represented and addressed along with operation timing constraints in creating and managing a plan for the process.

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45. The computer system of Claim 41, wherein the buffer model type has an operation that defines how material managed by a buffer is stored, and the specified operation model can be extended to specify different scrap factors.

46. The computer system of Claim 44, wherein the buffer model type has an operation that defines how material managed by a buffer is stored, and the buffer-plan models create operation-plan models to store the material managed by the buffer.

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47. The computer system of Claim 41, wherein the buffer model type has an operation that defines how material is received into a buffer and how the material is picked from the buffer.

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48. The computer system of Claim 44, wherein:
the buffer model type has an operation that defines how
material is received into a buffer and how material is picked
from the buffer; and

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the buffer-plan models create operation-plan models to
receive each lot of material and pick each lot consumed.

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49. The computer system of Claim 41, wherein:
the buffer model type has an operation that defines how
material managed by a buffer is stored, and the specified
operation model can be extended to specify different scrap
factors and has an operation that defines how material is
received into a buffer and how the material is picked from the
buffer;

such that a wide variety of resource models can be
represented in one network without greatly increasing
complexity of each resource model requiring only a small
subset of the overall software system modeling capabilities;
and

such that a complex hierarchy of operation models can be
formed to represent complex processes with many alternatives,
sequences, precedence constraints.

50. The computer system of Claim 44, wherein:
the buffer model type has an operation that defines how
material managed by a buffer is stored, and the specified
operation model can be extended to specify different scrap
factors and has an operation that defines how material is
received into a buffer and how the material is picked from the
buffer; and

the buffer-plan models create operation-plan models to receive each lot of material and pick each lot consumed and to store the material that is managed by the buffer at all times;

such that a wide variety of resource models and a plan for each of those resource models containing all decisions regarding capacity can be represented in one network without greatly increasing complexity of each resource model requiring only a small subset of the overall software system modeling capabilities; and

such that a complex hierarchy of operation models can be formed to represent complex processes with many alternatives, sequences, precedence constraints, and a plan for such a complex process can be represented with all the decisions to be made in order to define a particular plan.

6 51. The computer system of Claim 41, wherein each operation model may specify another operation and each buffer model may specify another buffer as its family and may specify a number of fields as inherited from that family, thereby allowing the fields to be changed in the family by a user, and result in changes to all models that inherit that field.

52. The computer system of Claim 51, wherein each operation model and buffer model that specifies a family can also specify a range of dates during which the model is effective such that outside of the range the model is modeled as if the model does not exist.

53. A computer system for executing computer software for modeling a process capability, the computer system comprising:

a data storage device operable to store data relating to a model of process capability;

an execution memory operable to store data representing computer software; and

a processor coupled to the data storage device and to the execution memory, the processor operable to execute the computer software, wherein the computer software system comprises;

a plurality of operation models defined from an operation model type, each operation model representing an activity that can be performed by a process; and

a plurality of buffer models defined from a buffer model type, each buffer model representing rules for controlling a flow of material between activities;

the operation model type and buffer model type each having a plurality of fields defining attributes; and

a process network model interrelating the operation models, the buffer models, and the resource models as nodes;

the process network model formed by a plurality of operation models each specifying buffer models from which material is consumed and buffer models to which material is supplied;

such that material usage is simultaneously represented by the process network model along with timing constraints between activities.

A2 54. The computer system of Claim 53, wherein the computer software further comprises;

a plurality of resource models defined from a resource model type, each resource model representing capacity available for use in performing an activity and rules for allocating capacity to the activity;

the resource model type having a plurality of fields defining attributes;

the process network model further formed by the plurality of operation models each specifying resource models having capacity used in performing the activity specified by the operation model;

such that both material and capacity usage are simultaneously represented by the process network model along with timing constraints between activities.

55. The computer system of Claim 54, wherein each plurality of fields include a plurality of extension selector fields that allow a user to specify one of a plurality of optional extensions incorporating additional fields and semantics in addition to fields specified by the model type into each model selecting the optional extension.

56. The computer system of Claim 55, wherein the computer software further comprises:

a plurality of operation-plan models defined from an operation-plan model type, each operation-plan model representing a planned activity to be performed during a particular period in order to achieve a particular purpose;

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a plurality of resource-plan models defined from a resource-plan model type, each resource-plan model representing an amount of available capacity and planned usage of the available capacity by operation-plan models; and

a plurality of buffer-plan models defined from a buffer-plan model type, each buffer-plan model representing planned flow of material that controlled by the buffer-plan model as a result of planned operation-plan models;

the operation-plan model types, buffer-plan model types, and resource-plan model types each having a plurality of fields that define attributes, including a plurality of extension selector fields corresponding to operation, buffer, and resource model type fields and specifying corresponding extension of a plurality of optional extensions which incorporate additional fields and semantics into each model selecting the optional extension in addition to those specified by the model type; and

a process-plan network model interrelating the operation models, the buffer models, and the resource models as nodes, the process-plan network model formed by operation-plan models specifying buffer-plan models from which material is consumed and buffer-plan models to which material is supplied and specifying resource-plan models having capacity planned to be used in order to perform the activity specified by the operation-plan model;

such that both material and capacity usage are simultaneously represented by the process-plan network model and addressed along with operation timing constraints in creating and managing a plan for the process.

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~~57~~. A method for modeling a process capability for use in process planning on the computer system, the method comprising:

defining a plurality of operation models from an operation model type, each operation model representing an activity that can be performed by a process;

defining a plurality of buffer models from a buffer model type, each buffer model representing rules for controlling a flow of material between activities, the activities represented operation models; and

interrelating the operation models and the buffer models as nodes in a process network model;

the process network model formed by the plurality of operation models each specifying buffer models from which material is consumed and buffer models to which material is supplied;

such that material usage is represented by the process network model along with timing constraints between activities.

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~~58~~. The method of Claim ~~57~~, further comprising:
defining a plurality of resource models from a resource model type, each resource model representing capacity available for use in performing an activity and rules for allocating capacity to the activity, the activity represented by an operation model;

interrelating the resource models as nodes in the process network model;

the process network model further formed by the plurality of operation models each specifying resource models having